

International Congress and Exhibition On Defense Test, Evaluation and Acquisition

The Global Marketplace

NORENE L. BLANCH

Twenty-first century defense requires a whole new set of paradigms when it comes to realistically dealing with the impact of new technology in the development of major defense weapons systems, the changing face of defense threats, and the new development and implementation of defense policy on test, evaluation, and acquisition.

Senior defense officials from the United States, Canada, and other allied nations came together to participate in the International Congress and Exhibition on Defense Test, Evaluation, and Acquisition: The Global Marketplace, held Feb. 27 — March 2, in Vancouver, British Columbia, Canada. This international event was organized and sponsored by the National Defense Industrial Association (NDIA) under the leadership of Samuel Campagna, Director, Operations, NDIA.

What Have We Learned?

The congress devoted the first day to providing a forum that featured tutorials on topics ranging from how to submit proposals for foreign comparative testing, to comparisons on how the United States, Canada, and other allied nations conduct test and evaluation; from independent test and evaluation of commercial products to the use of modeling and simulation to support test, evaluation, and acquisition.



Walter W. "Walt" Hollis, Deputy Under Secretary of the Army for Operations Research (right), is presented the National Defense Industrial Association (NDIA) Gold Medal by retired Army Maj. Gen. Paul L. Greenberg, Vice President, NDIA Operations, at The International Congress and Exhibition on Defense Test, Evaluation, and Acquisition. This year's event was held in Vancouver, British Columbia, Feb. 27 — March 2. Hollis was recognized for his dedicated and longstanding service in the field of Test and Evaluation. As continued recognition of his lifetime contributions, the Test and Evaluation Division of NDIA will present The Walter W. Hollis Award for Lifetime Achievement in Defense Test and Evaluation to a leader in the Defense Test and Evaluation community at each annual Test and Evaluation conference.

Blanch is an editor, Visual Arts and Press Department, Division of College Administration and Services, DSMC.

Industrial Committee on Operational Test and Evaluation (ICOTE)

An Industrial Committee on Operational Test and Evaluation (ICOTE) met simultaneously. John Stoddart, Vice President, Defense, Oshkosh Truck Corporation, Oshkosh Wis., is chair of the ICOTE. Stoddart explained who is involved and why this committee is so important to test and evaluation.

"I would have to say that the ICOTE is a body of senior executives from the government and industry dedicated to the proposition outlined by Jack Gansler [Under Secretary of Defense for Acquisition, Technology and Logistics], Dave Oliver [Principal Deputy Under Secretary of Defense for Acquisition, Technology and Logistics], and the other principals in streamlining acquisition. Our part of the acquisition process," Stoddart said, "deals with test and evaluation. Predominantly, we are a group made up of ground, air, and sea members of both industry and government. The purpose is to continuously improve the testing process rather than address discrete events."

Stoddart told the conferees that ICOTE's most significant contribution to the test and evaluation community was the standardization of release of acquisition (test) documentation to industry and the government. What this seemingly innocuous action did, Stoddart explained, "was to ensure that everyone was operating off the 'same sheet of music' to use a cliché." ICOTE also very importantly provides a forum for highest-level feedback for contractor concerns, he said, allowing Service component Operational Test Commands to discuss common points with their contractors, as well as their counterparts and their contractors.

"When you have action-oriented executives like Phil Coyle [Director, Operational Test and Evaluation] and Jim O'Bryon [Deputy Director, Operational Test and Evaluation/Live Fire Testing] on the one hand and senior executives from industry on the other, you not only get good ideas, you get problems solved and actions completed." Stoddart also



Retired Air Force Gen. Larry D. Welch, President, Institute for Defense Analyses, chaired a panel on "The Changing Face of Warfare." Said Welch, "I suggest to you that this changing face of warfare is not a young face. It's not an unlined face. It's a complex face. It reflects and has the marks of hard experience. It is tough and unforgiving. And we will indeed have to face it together."

spoke of the harmonization of the testing process, which allows for mid-course corrections and problems solved by an iterative process instead of a huge scramble at the end of a period. This, he said, allows for a better relationship and problem-solving process throughout the continuum, which is the acquisition process.

The Global Perspective

James F. O'Bryon, Deputy Director, Operational Test and Evaluation/Live Fire Testing, Office of the Secretary of Defense and Conference Chair, supported Stoddart's claim as he took the idea of cooperation from the national to the international level. There is no doubt, O'Bryon told the audience, that in order to develop, test, and acquire major weapons systems, the United States and allied governments have to begin to see things from a global perspective. Each government, according to O'Bryon, must: 1) evaluate what goods and services are available to them via the worldwide marketplace; 2) look closely at what they bring to the table; and 3) ask themselves what goods and services they offer that

will be beneficial on the international market.

The economic and defense relationship between Canada and the United States, O'Bryon said, is a good example of co-operation and positive assessment in order to achieve mutual benefit from each other's resources. The conference, he stated, was significant in shedding light on the sometime transparent partnership that exists between the two countries.

Why Canada?

"Why Canada?" was the question posed by O'Bryon in his welcoming address to the Congress. O'Bryon said he recently discovered that the United States conducts more defense-related imports to Canada than any other country. Presenting charts and statistics to support his claim, he proceeded to explain Canada's significance as a trade partner as well as a defense partner to the United States.

According to O'Bryon, statistics reveal that imports from the United States to Canada rose from \$100 million in 1995 to more than \$400 million in 1999. This increase far exceeded imports to any other country. "What we are seeing is an increase in the flow of goods exported from the U.S. into Canada, and in some cases we subsequently dropped some exports to other nations, so Canada is growing in importance to the U.S. as far as trade is concerned." Holding the congress in Vancouver, O'Bryon told the attendees, was indeed fitting as Canada continues to grow in importance in the area of trade.

Short on Dollars, Long on Impact

There remains little doubt and much discussion on how drastic budget reductions have impacted the U.S. Department of Defense in the past 10 years. This realization continues as the Office of the Secretary of Defense (OSD) takes note of how acquisition streamlining has impacted the acquisition community, and how acquisition reform has impacted test and evaluation.

This impact, O'Bryon said, not only affects test and evaluation, but it sends a rippling effect that also impacts the U.S. industrial base. The United States is not unique when it comes to implementing acquisition reform measures, but the need for undergoing acquisition reform is a key concern among allied nations as well, he concluded.

Canada Focuses on "Getting it Right"

Alan Williams, Assistant Deputy Minister, National Defence Headquarters, Canada's equivalent to Dr. Jacques S. Gansler, represented the conference voice "from our neighbors to the north." He spoke to the congress about Canada's acquisition reform efforts called "Getting it Right," describing them as Canada's means of "acquiring the right goods or services, at the right time, for the right price, to the right place, with the right support, applying the right rules, and with the right people."

Commenting on the importance of Canada's leveraging of industries' and allied nations' knowledge and experience in the area of test and evaluation, Williams also spoke of Canada's long history of commitment and participation in multinational operations.

"Today we are involved in more than 20 operations throughout the world. During 1999 we had more military deployed in more operations than the Korean War. In every case, Canada acted as part of a multinational operation. We fought and operated with and beside troops from around the world." Williams related that Canada has had a long history of defense alliances going back to World War II. Canada ranks as one of the founding members of the North Atlantic Treaty Organization (NATO), and he described Canada as having been a "channel of communication between key NATO countries" during the Cold War.

Williams emphasized Canada's continued commitment to the maintenance and enhancement of international defense relationships. This commitment is evident in the fact that Canada holds Memoranda of Agreement (MOA) with

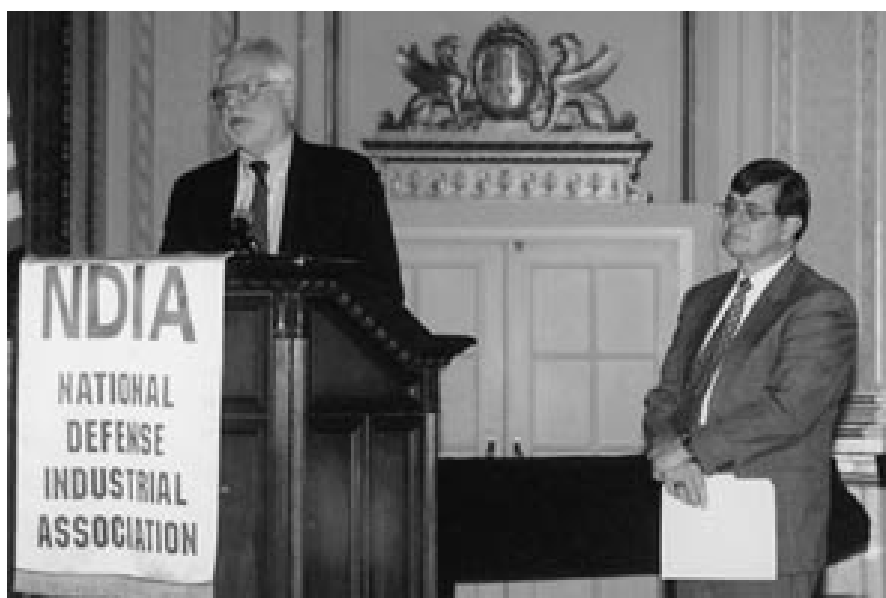
"It's astonishing to me that the Services have no money for research in better ways to do testing; they should have. To give our people every opportunity to succeed, we need to invest in their ideas. I've begun the process to obtain new applied research funds to allow this to take place."

**—Philip E. Coyle
Director, Operational Test & Evaluation**

17 countries other than the United States. "With the U.S., we have over 1,000 [MOA] — some going back nearly a half century.

"Throughout the years," Williams said, "the U.S. and Canadian defence industrial bases became so integrated that Congress defined the United States technology and industrial base as 'the research and development, production, and maintenance capabilities of the United States and Canada.' So under U.S. law, the Canadian firms in our special defence economic partnership are considered part of the U.S. defence industrial base."

He also discussed the partnership between the United States and Canada in the North American Technology and Industrial Base Organization (NATIBO). This organization, he explained, promotes cooperation between the two countries and "promotes a cost-effective, healthy technology and industrial base that is responsive to the national and economic security needs of the United States and Canada." [More information on NATIBO is available on the Web at <http://www.dtic.mil/natibo/purpose.html>.]



OSD's Director of Operational Test and Evaluation Philip E. Coyle (left) delivers the DoD keynote address, "New Paradigms for Organizing and Managing Defense Test, Evaluation and Acquisition." Introducing Coyle is James F. O'Bryon, Deputy Director, Operational Test and Evaluation/Live Fire Testing.

Another partnership between Canada and the United States is the Canada/United States Test and Evaluation Program (CANUSTEP), according to Williams. "The idea behind CANUSTEP is very simple. Canada and the U.S. agree to make their test and evaluation capabilities and facilities available to the other on an incremental basis."

Canada has historically been, and presently continues to be, actively involved in international collaborative efforts, according to Williams. "Canada's international defence partnerships have been vital to our ability to operate in today's multinational environment. Through our special relationships with the U.S. —which have promoted a very high level of standardization and interoperability — Canada was able, in the recent operations in Kosovo, to be fully and immediately integrated into NATO's bombing operations, contributing their fair share."

Williams assured the attendees that "Defence alliances are more vital then ever to Canada and to its security partners." These alliances include both industry and other countries, he added. Concluding, Williams said, "The success of these alliances and our continuing technological advances will ensure our security as we proceed into the new millennium."

New Opportunities — New Paradigms

The test and evaluation community in the United States has no problem understanding Canada's need to streamline acquisition, according to Philip E. Coyle, Director, Operational Test and Evaluation, OSD. Coyle noted that although DoD's acquisition reform efforts have been successful, this success has come at a heavy price. Because of this price, it is time to explore new opportunities and embrace new paradigms in Test and Evaluation, he stated.

Repeating an old joke that nonetheless expresses a sobering truth, Coyle said, "Part of the reason we need new paradigms is because our test ranges don't have a 'pair of dimes' to rub together any-

more." DoD needs a new way of thinking," said Coyle, "about how test and evaluation is conducted."

In his Annual Report to the Secretary of Defense and the Congress, he said we need a new approach "to get away from constantly studying T&E resources with the aim of reducing them — T&E has already been reduced beyond the optimum level to support acquisition."

Coyle described his first paradigm regarding T&E. "My paradigm is that we are going to build for the future. Building for the future in T&E is sufficiently unprecedented that it ought to attract an enduring group of adherents — getting new investment in T&E is sufficiently unprecedented that you should like the idea."

Coyle's second paradigm focuses on building and investment. "Building for the future is sufficiently open-ended and presents many problems for us to solve. Getting new investment for T&E is sufficiently open-ended that there is lots of work for us all to do."

But, the willingness to embrace new paradigms leads to new opportunities. "I can think of scores of new opportunities in test and evaluation," Coyle said as he proceeded to outline 10 new opportunities in store for T&E.

No. 1 — Reorganization of Test and Evaluation

Test and Evaluation in OSD has been reorganized giving DOT&E the responsibility for stewardship of the nation's test ranges along with the traditional roles in operational and live fire testing. "Stewardship, real stewardship, of the test ranges," said Coyle, "means not just hanging on to the facilities we have, but building for a future with new technologies involved in testing, and supporting the new technologies in the systems under test. It means that we will stop planning cuts and start planning investments."

No. 2 — No More Cuts

The Board of Directors [BoD], which has been made up of the Service Vice Chiefs

of Staff and now OSD, are working together in ways they never have before. The Board of Directors has included DOT&E as a full member and partner, and all have agreed together that they are not interested in cutting T&E any more.

To build for the future, the BoD has committed to a series of strategic planning workshops. "We will try to lay out a vision and a strategy for strengthening and rebuilding our test centers for a new future."

No. 3 — Building in Flexibility

OSD and the Services are developing a new approach to acquisition that builds in the flexibility to take new ideas from the laboratories to the test ranges more spontaneously and more rapidly. "A new DoD 5000 is being written to guide this approach," Coyle said, "and it surely will present many new opportunities for DoD test centers and for industry. It also will invite new partnerships between DoD test centers and industry for developmental testing, as well as reinforce the need for an early operational focus in all testing regardless of where it is done."

No. 4 — Early Operational Focus

DOT&E is trying to bring an early operational focus to developmental and operational testing, with early involvement by the Service Operational Test Agencies, and closer partnerships with the Major Range and Test Facility Bases. This, according to Coyle, will provide operational insight and feedback early in the acquisition cycle while change is still relatively painless. These changes will benefit the test ranges, he explained, because they will bring an earlier focus to the spectrum of tests that must be done and the facilities needed for those tests. These changes will also benefit contractors and the national defense by identifying and solving problems early, the type of problems that have delayed new military equipment to the warfighter too often in the past.

No. 5 — Interoperability

"There is tremendous opportunity, not to mention challenge, in interoperability," Coyle stated. Under Secretary

Gansler and [former] Vice Chairman [Gen. Joe] Ralston have issued a new policy, said Coyle, requiring interoperability to be a Key Performance Parameter (KPP) for all new acquisition systems. As Dr. Gansler noted in a recent memorandum, "Recent events, including results from a number of Warfighter Operational Evaluations, have reemphasized the need for improved interoperability, both for U.S. forces and with those of our coalition partners ... this will require new efforts in all steps of the acquisition process, for all systems, and at all ACAT [Acquisition Category] levels."

Interoperability testing will involve global systems and international partnerships, not just interoperability Service-to-Service, Coyle noted. DOT&E, he emphasized, especially needs ideas from industry for new investments that could improve interoperability testing and interoperability with coalition forces.

"What we're seeing is a new mission focus in testing and training," said Coyle. "Mission includes interoperability. Mission includes coalition partners. Mission includes tactics, techniques, and procedures that are validated in testing and training. Training is moving beyond the operator to a mission focus, and testing is moving beyond the single system to integrated systems of systems."

No. 6 — Reversing the Trend

There is opportunity in the fact that people in OSD, in the Services, and in Congress realize that testing has been cut too much and are trying to reverse the trend, according to Coyle. But it won't be easy, he warned. Coyle went on to say that all the Services have many demands on their budgets. The Army is trying to build a new lighter-weight force. That will be expensive, he commented, especially with the investment in battlefield digitization the Army has already begun. The Navy is trying to develop new theater missile-defense systems and the tech-

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Director, Operational Test & Evaluation**

nologies for managing a complex battlespace so that it is truly a single integrated picture. The Air Force is trying to take precision engagement to new levels and requires funding for many new high-technology aerospace programs that are not being funded under the weight of important but large aircraft programs. "All these pressures, and many more I've not mentioned," Coyle said, "will keep test and evaluation under pressure."

No. 7 — Cutting T&E Doesn't Always Save Money

Coyle said that people in both government and industry are beginning to realize that when T&E doesn't have the capacity to support acquisition programs — or acquisition programs have to wait in line — it costs much more than was saved by cutting T&E. In his Annual Report this year, Coyle cited specific examples of acquisition programs that had to wait for T&E. A month's delay in a large acquisition program, he commented, is serious money.

The Defense Science Board Task Force on T&E said it well: "The focus of T&E

should be on optimizing support to the acquisition process, not on minimizing (or even optimizing) T&E capacity." This means, Coyle explained, that people are beginning to think differently about T&E capacity. Where a few years ago the preoccupation was on "excess" capacity, now people realize that DoD needs readiness capacity in T&E, just as DoD needs readiness for the warfighter.

"If T&E isn't ready, new equipment takes longer and costs more to reach the warfighter, which affects warfighter readiness just as surely as inadequate operating support or inadequate training can hurt readiness," Coyle said. "We need readiness capacity in T&E, just as we need readiness capacity in our daily lives." To illustrate, he used an analogy with which those living in and around the nation's capital could readily identify. "We don't close the outer loop of the beltway in order to eliminate the excess [traffic] that exists during most of the day. We try to optimize the value added by our roadways to the sum of daily life." Coyle said that DoD needs to build for the future by optimizing the contributions and value added of T&E to the sum total of the acquisition process.

No. 8 — Increased Funding

Funding for acquisition and weapons modernization is going up, Coyle noted. In the President's new budget, weapons modernization is up 50 percent in fiscal year 2001 from its low in fiscal year 1997. "This means new programs," he said, "and new programs mean more work for testing. And the workload in T&E has been very robust throughout the decade of the nineties.

"In operational testing it has gone up. At AFOTEC [Air Force Operational Test and Evaluation Center], their workload has tripled; at ATEC [Army Test and Evaluation Command], their workload has doubled; and at OPTEVFOR [Operational Test and Evaluation Forces (Navy)], it is the highest at any time in

their history. In developmental testing, the workload has gone up in some areas and is down or steady in others." Overall, Coyle emphasized, the developmental test workload is steady and very robust. And overall it has not gone down as people thought it would earlier in the decade.

No. 9 — Industry Reliance On DoD Test Ranges

Industry is under many of the same pressures to consolidate their T&E capabilities as at DoD test ranges, said Coyle. With each new merger, large defense contractors have found that they must work to reduce their test infrastructure. But can they count on the DoD?

"To rely on DoD test ranges," said Coyle, "industry needs to be sure of three things: First, they need to know that we will be there when they need us, that we will honor their schedules. Second, they need to know what testing will cost and be able to depend on that price. And third, they need to know that we can keep a secret, that they can test proprietary ideas and keep them proprietary."

Coyle went on to say that the same is true for global partners. If other nations bring work to DoD test ranges or DoD takes work to theirs, protocols are needed that protect the interests of both parties, including the environment, cost sharing, and scheduling. An example Coyle cited was the recently renewed partnership the United States has with Canada at the Nanoose Range, not far from Vancouver. The United States benefits from the natural properties of a unique underwater test area and a 35-year partnership of good will and cooperation.

No. 10 — Funding for New Ideas and Concepts

Coyle stated his belief that there is opportunity for the people at DoD's test centers — people who have new ideas and new concepts. "I believe we need funding for research in T&E. Some of your new ideas need to be tried out before you can sell them to a program manager. This takes test technology funding. It's astonishing to me that the Services have no



Thomas E. Peoples, Senior Vice President, International and Washington Operations, GenCorp, delivers the Industry keynote address, "Strategic Vision for the Future of Defense and Allied Cooperation."

money for research in better ways to do testing; they should have. To give our people every opportunity to succeed, we need to invest in their ideas. I've begun the process to obtain new applied research funds to allow this to take place."

Making a Difference

Coyle spoke of the single most important step testers and evaluators can take to maximize their T&E opportunities. "First, every day tell someone — someone who you think can make a difference — about the special problems you face at your range or test center, in your business or industry. That includes people in the Military Departments, and at the test centers, as well as me. No one is conveying these messages well, and as a result very few people actually know what kinds of problems you have. I try to do this every day; often several times a day.

Coyle told the audience they'd be amazed at how few people in Congress or OSD or the Military Departments have the faintest idea about the cuts T&E has endured. "They think you haven't suffered as much as the rest of the Army, or the Navy, or the Air Force. Or that your industry hasn't suffered as much as others. People are surprised when I explain the severity of the cuts; at first they don't believe me because they haven't heard of the impacts before."

ANNUAL AWARDS BANQUET

1999 TESTERS OF THE YEAR

A highlight of the conference was the awards banquet where the following individuals were recognized as Outstanding Testers of the Year.

Office of the Secretary of Defense

Civilian

Eric L. Kech, Technical Advisor,
JADS/JTF

Military

Army Col. Terry Mitchell,
OSD/DOT&E

Contractor

Dale Leischer, Sikorsky

Department of the Army

Civilian

Colleen Devlin, USAEC

Military

Army Maj. Layne B. Merritt, USADTC

Contractor

Robert Hadden, Maden Tech
Consulting, Inc.

Department of the Navy

Civilian

James A. O'Neill, NAVSEA

Military

Navy Cmdr. Jeffrey R. Penfield,
OT&EF

Contractor

Chris Baniewicz, Lockheed Martin

Department of the Air Force

Civilian

Gary L. Black, Tyndall AFB

Military

Air Force Capt. Charles D. Ormsby,
Holloman, AFB

Contractor

Emmett A. Redding,
MacAulay Brown Inc.

Part of the problem, Coyle believes, is the military tradition that you don't whine. "If we don't tell people," Coyle said, "they won't know." He also said that the T&E community would not have had to suffer all the cuts of the past decade if it had been able to articulate the damage that was being done — to readiness, to test capability, and to acquisition programs themselves. "I try to do this every day, and I'm asking you to do this also," Coyle challenged. "Find someone who you think can make a difference and *tell them!*"

Changing Face of Warfare — Working Together

Many panel discussions took place during the conference, covering issues of major impact to the future of program management test and evaluation.

- International Test, Evaluation, and Acquisition Issues
- Sharing Test Ranges
- Facilities and Capabilities Across Borders
- Canadian Defence Test, Evaluation, and Acquisition
- Interoperability
- Test and Evaluation of Multinationally Produced Hardware
- Nuclear Weapons Safety
- Modeling and Simulation
- International Testing and Cooperative Use of Facilities
- Integrated Testing and Training
- Changes in Warfare Methods
- Survivability
- Impact of Environmental Regulations on Defense Test, Evaluation, and Training
- International Synthesis Panel

Each issue addressed by the various panels communicated the changes that have occurred in the way the United States and its allied nations conduct warfare. The panel discussion on the Changing Faces of Warfare, however, cut to the heart of this issue.

Led by retired Air Force Gen. Larry D. Welch, president of the Institute for Defense Analyses and former U.S. Air Force Chief of Staff, other panel members included: Dr. James A. Boutillier, Special Advisor for Policy, Maritime Forces, Pacific Headquarters, Victoria, British Co-



Alan Williams, Assistant Deputy Minister, National Defence Headquarters, Canada, speaks on "Canadian Defence Acquisition and Support - Getting It Right for the New Millennium."

lumbia; David Chu, Vice President for Army Research, RAND Corporation, Director, Arroyo Center, and former Assistant Secretary of Defense for Program Analysis and Evaluation; and retired Navy Rear Adm. John Zerr, Vice President, The Boeing Company and former Commander, Operational Test and Evaluation Force.

Introducing the panel, Welch stated, "The future face of war is not very clear, even the current face of war is not clear." He talked about how the threat of cataclysmic warfare faded as the Cold War went into the dustbin of history. Still, DoD found that, in fact, there was a dramatic increase in the demand for multinational armed forces to deal with various levels of contingencies, ranging all the way from humanitarian actions in response to natural disasters, to major conflict.

Welch noted the dramatic increase in lethal confrontations around the world, commenting that "Longstanding animosities, some of them centuries old, frozen to inaction for 50 years by the Cold War, thawed into a very dangerous soup of new and more effective ways to kill people."

Welch also talked about the nation's new role as peacekeepers and the practice of designing forces for major war and then just doing the best we can with those forces when they're called on to do things other than major war. This, he noted, was an acceptable practice during the Cold War, but that is no longer the case. "The standard of performance, across the entire range of warfare or the entire range of contingencies, from humanitarian to major war, has become near-perfection. People expect no lost battles, near-zero combat casualties, and even near-zero collateral damage against adversaries." Some of these characteristics sound like impossible standards, he admitted, but the good news, according to Welch, is that "There is some reason to believe that something like that might be possible." He went on to name three of the changes in the nature of warfare and the capabilities that have brought about permanent change.

Battlespace Awareness

One change, is battlespace awareness as a basis for decision superiority — to get the right force, at the right place, at the right time.

Precision Navigation

The second one is precision navigation. Knowing where you are, Welch said, is a prelude to knowing where it is that you're going. Precision navigation also provides a much higher degree of assurance that the warfighter gets to the right place at the right time. And finally, precision navigation, Welch stated, is indeed an important difference in the way DoD conducts warfare today.

Precision Munitions

Precision munitions allow warfighters to destroy targets, and only the targets that they intend to destroy, and to do so with minimum force.

Concluding, Welch described the changing face of warfare. "So I suggest to you that this changing face of warfare is not a young face. It's not an unlined face. It's a complex face. It reflects and has the marks of hard experience. It is tough and unforgiving. And we will indeed have to face it together.

CANADA'S ROY BRANDER ON THE TEST, EVALUATION AND ACQUISITION OF THE *TITANIC*

Capping off the Annual Awards Banquet for the International Congress on Defense Test, Evaluation and Acquisition was a fascinating presentation by Roy Brander of Canada. Brander revealed his research and insights, complete with charts and photos, into the lessons to be learned from the Test, Evaluation and Acquisition of the *Titanic*.

The *Titanic*, a steamship in England's White Star Line, set out on its doomed maiden voyage, with 2,227 enthusiastic passengers and crew members on board for the history-making trip from Southampton, England, to New York City. Only 705 would survive the ship's collision with a massive iceberg.

Titanic was one of the largest movable objects ever built, measuring in at 883 feet long (1/6 of a mile), 92 feet wide, 46,328 tons, and 104 feet high, from keel to bridge.

The ship was designed to hold 32 lifeboats, though only 20 were on board; White Star management was concerned that too many boats would sully the aesthetic beauty of the ship. Survivors were rescued by the *Carpathia*, which was 58 miles southeast of *Titanic* when it received the distress call.



Titanic boasted electric elevators, a swimming pool, a squash court, a Turkish Bath, and a gymnasium with a mechanical horse and mechanical camel.

The wreckage of *Titanic* was recovered in 1985, 12,500 feet down, about 350 miles (531 km) southeast of Newfoundland, Canada.

International Students Add Cultural Awareness, Diversity to APMC 00-2



Anderson (above right) welcomes Navy Capt. Peter Liao from Taiwan, to the APMC 00-2 reception May 8.

Photos by Richard Mattox

Air Force Brig. Gen. Frank Anderson, DSMC Commandant (below, second from left) and Tony Kausal, DSMC Air Force Chair (far right) welcome Dr. Eui Dong Park (far left) and Lt. Col. Tae-ho Hwang from the Korean Ministry of National Defense at a reception for Class 00-2, Advanced Program Management Course (APMC) May 8. Both students are attending APMC as part of the College's efforts to promote greater working relationships with our allies on Cooperative Acquisition Programs.

